

**Crambus oslarellus** sp. nov.

Expanse of wings 25-30 mm. Head and palpi cinereous. Primaries and thorax lustrous bronze, with a silvery white stripe from the base to near subterminal line; a tooth in the middle on the lower side, and a small white spot above the outer end of white stripes. Secondaries smoky white. The species closely resembles *Crambus praeffectellus*, and has no doubt been confounded with it. The principal points of difference are its much larger size, the smoky hind wings, and the absence of reddish line inside of white subterminal line, which is present in *praeffectellus*; also the subterminal line forms nearly a right angle, which is not the case in *praeffectellus*.

Described from ten specimens, collected at Silverton, Colo., and Clear Creek, Colo., vii, 3, '07, by Mr. E. J. Oslar, in whose honor this species is named.

---

### Three related American species of *Aeshna* (Odonata).

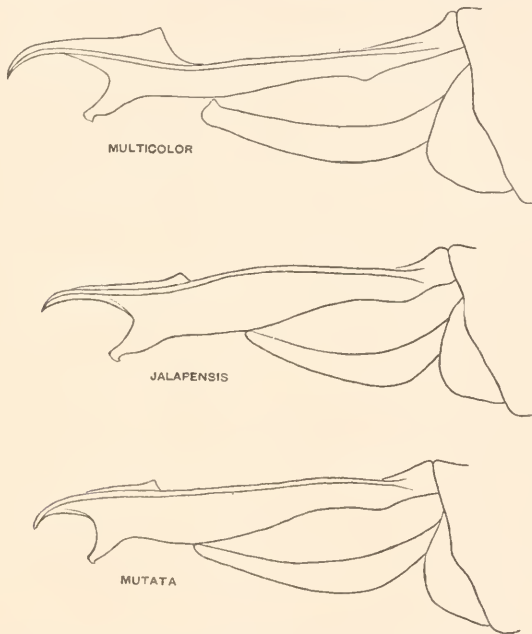
By E. B. WILLIAMSON.

The three species are: *multicolor* Hagen, *mutata* Hagen and *jalapensis* n. sp. They are characterized as follows:

Rs forking proximal to the level of the stigma, with 3 or 4 rows of cells between the fork at the level of the distal end of stigma; the proximal side of the triangle in hind wing more than half as long as the posterior side; membranule fuscous with the base more or less white or gray; stigma of adult males dark brown or black above; dark yellowish brown beneath; immature males and females have the stigma golden yellow, paler beneath; a ventral spinulose tubercle on abdominal segment 1; a black T-shaped spot on the frons, which spot widens posteriorly to enclose the vesicle in black, and margins the eyes in front with a line of black; thorax brown with a dorsal and two lateral stripes on each side; legs black, the first femora of both sexes beneath with a pale streak for half their length and all femora of females reddish brown above for the greater part of their length; abdomen constricted at segment 3; males with a minute median dorsal tooth on abdominal segment 10, and appendages seen in profile distinctly forked at apex with an angulate dorsal carina; abdominal appendages of the female of usual form, the apex rounded obtuse, varying from 5 to 7 mm. in length in different species.

DIFFERENTIALS:—*Mutata* and *jalapensis* are separated at once from *multicolor*: males,—the inferior basal tubercle of the superior appendages in *multicolor* at one-fourth to one-fifth the length of the appendage, in *jalapensis* and *mutata* at one-

sixth to one-seventh the length of the appendage; and the narrower appendage and higher keel of *multicolor* as compared with *jalapensis* and *mutata*, as seen in profile; females,—each abdominal appendage of *multicolor* is nearly symmetrical, the outer and inner edges with about the same curvature; the length 5 mm.; in *jalapensis* and *mutata* the outer edge of each appendage is nearly straight, the inner edge broadly curved; the length 6 mm. in *jalapensis* and 7 mm. in *mutata*. By appendages of males *jalapensis* and *mutata* are separated by the



longer dorsal carina and apical fork of the superiors, and the shorter (one-half the length of the superiors) inferior in *jalapensis*; in *mutata* the apical fork is reduced in size and the inferior appendage is two-thirds the length of the superiors.

The ventral spinulose tubercle on abdominal segment 1 is most pronounced in *jalapensis* and *multicolor*, the spinulose area in *mutata* being raised into only a very low tubercle. On segment 2 on margins about the accessory genitalia *mutata* is more spinulose than the other two.

The T-shaped spot on frons is best developed in *jalapensis*, and of smallest area in *multicolor*. In *multicolor* the stem of the T in front is about .66 mm. wide and the sides of the stem are straight or slightly concave, diverging posteriorly and isolating the blue vesicle and the lateral ocelli from the blue area of the frons by a band of black about twice as wide as the ocelli. The ocelli are separated from the blue vesicle by a line of black narrower than the ocelli. In *mutata* the stem of the T in front is wider than in *multicolor* but scarcely 1 mm. wide, but the sides, instead of being concave, are distinctly convex, and the vesicle is less blue, the vesicle and the lateral ocelli more widely separated from the blue area of the frons, and the lateral ocelli separated from the vesicle by a line of black fully as wide as the ocelli. In *jalapensis* the stem of the T in front is over 1 mm. wide, the sides straight but more divergent than in the other two species, the lateral ocelli and vesicle isolated from the blue area of the frons by a band of black about three times as wide as the diameter of the ocelli; the extent of blue on the vesicle as in *mutata*.

In coloration of abdomen males of *mutata* and *multicolor* are almost identical, although the blue spots are slightly reduced in *mutata* especially on segment 10; *jalapensis* has the spots greatly reduced. A similar reduction is true also of the more obscurely colored females. In the matter of coloration of *jalapensis* and *mutata* we have an exactly parallel case in the two species with very similar appendages which have been associated under the name *constricta*. In this case, as in the case of *mutata* and *jalapensis*, the species with the dark-colored abdomen is the slenderer, less robust of thorax. The habits of the two species associated under *constricta* are well known to me and are entirely distinct; it is probable that *mutata* and *jalapensis* show a parallel difference in habits.

Some venational characters of the three species are tabulated below. These may be summarized briefly, calling attention to *mutata* and *multicolor* especially, since in these venational differences are most constant.

1. *Mutata* compared with *multicolor* has narrower wings with distinctly less curved supplements and a more distal ter-

mination of  $Cu_1$  at wing margin; (*jalapensis* is fairly intermediate in these characters).

2. In *mutata* the anal loop is distinctly wider, with a median cell and shorter outer side than in *multicolor*; (*jalapensis* has a wide anal loop of a form similar to *mutata*, but the outer side is variable in length).

3. *Mutata* has a larger number of cells in the wings as shown by:

a. The presence generally of two rows of cells throughout between  $M_3$  and  $M_4$  in hind wing distal to point where two rows of cells first appear between these veins; (*jalapensis* intermediate).

b. The larger number of cubito-anal cross veins in both front and hind wings; (*jalapensis* intermediate).

c. The larger number of cells in the triangle of hind wing; (*jalapensis* resembles *multicolor*).

d. The larger number of cross veins in the supertriangle of both front and hind wings; (*jalapensis* intermediate).

e. The larger number of antenodals and postnodals in both front and hind wings; (*jalapensis* resembles *mutata*).

f. The more proximal origin of  $M_{1a}$ ; (*jalapensis* resembles *multicolor*).

4. In *mutata* the more distal position of the arculus in terms of its relation to antenodal crossveins; (*jalapensis* intermediate, resembling *mutata*).

#### TABULATION OF VENATIONAL CHARACTERS.

The figures in the columns headed respectively "*multicolor*," "*jalapensis*" and "*mutata*" are in all cases those of percentages.

CHARACTERS	<i>multicolor</i>		<i>jalapensis</i>		<i>mutata</i>	
	10 ♂	2 ♀	5 ♂	1 ♀	10 ♂	2 ♀
	male	female	male	female	male	female
Length of stigma in front wing	3 mm.		30	100	100	
	3.5 "		70	50		50
	4 "			50		50 100
$M_{1a}$ in front wing arising	under stigma			10		15
	at distal end of stigma			20	100	55
	beyond stigma		100	100	70	30 50

CHARACTERS	<i>multicolor</i>		<i>jalapensis</i>		<i>mulata</i>		
	10 ♂	2 ♀	5 ♂	1 ♀	10 ♂	2 ♀	
	male	female	male	female	male	female	
Wings narrower, supplements less curved ( <i>a</i> )					100	100	
Wings wider, supplements more curved ( <i>b</i> )	100	100					
Wings intermediate in width, curving of supplements intermediate ( <i>c</i> )			100	100			
Cu <sub>1</sub> in hind wing meeting wing margin with reference to level of nodus ( <i>d</i> )	{ 4 marginal cells beyond 3 cells beyond 2-3 cells beyond 2 cells beyond 1-2 cells beyond 1 cell beyond on same level		50		10	100	
		10		20	100	30	
		40	50	40			
		50		40			
Anal loop wide, A <sub>2</sub> arising basal to the last cubito-anal ( <i>e</i> ) cross-vein before the sub-triangle			100	100	100	100	
Anal loop narrower, A <sub>2</sub> arising opposite or distal to last cubito-anal cross-vein	100	100					
Anal loop with a median cell ( <i>i.e.</i> more than 2 cells wide near its middle)	30		100	100	100	100	
Anal loop without a median cell	70	100					
Outer side of anal loop (formed by Cu <sub>2</sub> and A <sub>1</sub> before their separation) in hind wing	{ About as long as inner side of triangle ( <i>f</i> ) Longer than inner side of triangle ( <i>g</i> )		20	100	100	100	
		100	100	80			
From the point where 2 rows of cells appear between M <sub>3</sub> and M <sub>4</sub> in hind wing to wing margin	{ 2 rows of cells between throughout For at least part of this distance only 1 row of cells	15		40	100	75	75
		85	100	60		25	25
Arculus in front wing	{ Opposite second antenodal Between second and third, nearer second Between second and third, nearer third Opposite third Between third and fourth	10	25				
		85	75	10			
		5		90	100	25	100
						60	15
Arculus in hind wing	{ Between first and second antenodals Opposite second Between second and third	90	25	10		10	
		10	75	40		10	100
				50	100	80	

CHARACTERS	<i>multicolor</i>		<i>jalapensis</i>		<i>mutata</i>		
	10 ♂	2 ♀	5 ♂	1 ♀	10 ♂	2 ♀	
	male	female	male	female	male	female	
Apex of triangle of hind wing with reference to the cross-veins between $M_{1-3}$ and $M_4$	{ Between the third and fourth { Opposite fourth { Between the fourth and fifth { Opposite fifth { Between the fifth and sixth { Opposite sixth	25	25	20			
		45	50	10	50	20	
		30	25	60	50	35	50
				10		10	50
				30			
				5			
Cubito anal cross-veins in front wing ( <i>h</i> )	{ 5 { 6 { 7	55	50	20		10	50 ( <i>i</i> )
		45	50	80	100	40	50 ( <i>j</i> )
						50	
Cubito-anal cross-veins in hind wing ( <i>h</i> )	{ 3 { 4 { 5 { 6	5 ( <i>k</i> )					
		20	25				
		70	75	100	50	45	50
		5			50	55	50
Triangle, front wing	{ With two transverse cross-veins, 3-celled { With two transverse cross-veins, proximal cell divided, 4-celled { With three transverse cross-veins, proximal cell divided, 5-celled { With three transverse cross-veins, two proximal cells divided, 6-celled					10 ( <i>l</i> )	
		35	75	20	50	90	100
		55	25	70	50		
		10 ( <i>l</i> )		10			
Triangle, hind wing	{ With one transverse cross-vein, proximal cell divided, 3-celled { With two transverse cross-veins, proximal cell divided, 4-celled { With three transverse cross-veins, proximal cell divided, 5 celled	5					
		85	100	60	100	10	50
		10		40		90	50
Supertriangular cross-veins in front wing	{ 2 { 3 { 4	60	50	10		25	25
		40	50	90	100	70	75
						5	
Supertriangular cross-veins in hind wing	{ 1 { 2 { 3	25	25				
		75	75	100	100	40	75
						60	25

CHARACTERS	<i>multicolor</i>		<i>jalapensis</i>		<i>mutata</i>		
	10 ♂	2 ♀	5 ♂	1 ♀	10 ♂	2 ♀	
	male	female	male	female	male	female	
Antenodals in left front wing	14	10					
	15	30					
	16	30	50				
	17			60	100	10	50
	18	30		20		40	50
	19					40	
	20			20			
	21				10		
Postnodals in left front wing	7						
	8		50				
	9	40	50				
	10	60			10	100	
	11		40		20		
	12		40	100	50		
			20		20		
Ante- and postnodals in left front wing	21		50				
	24	30	50				
	25	20					
	26	20				50	
	27	10		20		20	50
	28	20		40	100	10	
	29			20		10	
	30					50	
	31			20			
	33					10	
Antenodals in left hind wing	9	10	100				
	10	40		40			
	11	40		40	100	20	
	12	10		20		30	50
	13					40	50
	14				10		
Postnodals in left hind wings	9		50				
	10	40	50				
	11	20		40	100	10	50
	12	30		20		20	50
	13	10				60	
	14			40			
Ante- and postnodals in left hind wing	18		50				
	19	10	50				
	20	30					
	21	10		40			
	22	10			100	20	
	23	20		20		10	50
	24	20					
	25			20		30	50
	26			20		30	
	27					10	

## NOTES ON THE PRECEDING TABULATION.

a. In all specimens 3 rows of cells between Rs and the radial supplement and  $M_4$  and the median supplement, excepting in 2 ♂ hind wings, where there are 4 rows between  $M_4$  and the median supplement.

b. In 3 ♂ there are 3 rows of cells throughout between Rs and the radial supplement and  $M_4$  and the median supplement; in 5 ♂ there are 4 rows of cells between throughout; in 1 ♂ there are 3 rows between Rs and the radial supplement in both front wings and in one hind wing, 4 rows elsewhere; in 1 ♂ there are 4 rows between  $M_4$  and the median supplement in both hind wings, 3 rows elsewhere; in 1 ♀ there are 4 rows between  $M_4$  and the median supplement in one hind wing, 3 rows elsewhere; in 1 ♀ there are 3 rows between Rs and the radial supplement in one front wing, between  $M_4$  and the median supplement in both front wings, and 4 rows elsewhere.

c. In 2 ♂ there are 4 rows of cells throughout between Rs and the radial supplement and  $M_4$  and the median supplement; in 1 ♂ there are 3 rows of cells between throughout; in 2 ♂ there are 3 rows of cells throughout excepting that in both hind wings of each specimen there are 4 rows of cells between  $M_4$  and the median supplement; in the ♀ there are 4 rows of cells between throughout, excepting between  $M_4$  and the median supplement in one front wing and Rs and the radial supplement in one hind wing, where there are 3 rows. (It should be stated that curving of supplements does not vary in a species with variation in number of rows of cells between veins and supplements, though it is true that among species those with straightened supplements have a reduced number of included cells.)

d. This character is of slight if any value because of the difficulty of accurate determination due to varying degrees in which the wing veins of dried specimens do not lie in the same plane.

e. Excepting in 4 wings ♂, 2 wings ♀ *mutata* and 4 wings ♂, 2 wings ♀ *jalapensis* where  $A_0$  arises distal to last cubito-anal crossvein, but the anal loop is of usual width.

f. In every case but 1 wing of a ♂ *mutata* there are 2 cells on distal side of this outer side of anal loop; in this one wing there is only 1 cell.

g. In 18 wings ♂, 2 wings ♀ *multicolor* there are 2 cells on distal side of outer side of anal loop; 2 wings ♂, 2 wings ♀ *multicolor* and 1 wing ♂ *jalapensis* with 3 rows of cells on distal side.

h. The crossveins forming the subtriangle and dividing the subtriangle are counted.

i. In these 2 wings ♂, 2 wings ♀ *mutata* the subtriangle is not crossed; in one other wing of *mutata* ♀ the subtriangle is free; in all other cases the subtriangle is once crossed.

j. One wing ♀ with free subtriangle.

k. The subtriangle free in this wing; crossed in all other wings examined.

l. One individual, both wings.

(To be continued.)



## Incidental Studies of new species of *Oscinis*.

By E. S. TUCKER,

Special Agent, Bureau of Entomology, U. S. Dept. of Agric.

In my incidental studies of flies which were obtained by personal collecting during past and more recent years, four forms have been found belonging in the genus *Oscinis*, which fail to agree with any known species, and, in consequence, they are named and described herewith as new.

### *Oscinis nigra* n. sp.

Colorado,—Denver; August, 1906. Type: one specimen deposited in the U. S. National Museum.

Wholly black, except fulvous tinge of halteres, and dull reddish eyes. Body and legs shining. Triangular space of front extending from the vertex to a point against the antennal insertions, lower angular edges of front dull opaque. Dorsum of thorax minutely punctured, bearing scattered black bristles, sides fringed; scutellum having two apical bristles of great length.

First and second sections of wings equal in length, third section about two-thirds the length of either one of the preceding, and fourth section one-half the length. Third and fourth longitudinal veins scarcely divergent. Length, 1.5 mm.

This specimen differs from all previously described forms of *Oscinis* on account of total absence of yellow or fulvous color, other than on the halteres.

### *Oscinis flavescens* n. sp.

Colorado,—Manitou, 6629 ft.; August, 1894. Type: one specimen deposited in the U. S. National Museum.

Prevailing color yellow, with black markings as follows: A small spot on vertex enveloping the ocelli; three broad longitudinal stripes on mesonotum, the medial, except towards the distal end, is twice the width of a lateral one, beginning on the prothorax in advance of them and extending the entire length of mesonotum, while the lateral stripes taper to an end before reaching the posterior margin; metathorax polished black beneath the scutellum; dorsal base of abdomen and a median spot arising from anterior edge of second segment black, basal margin with a pronounced and rounded middle expansion on each succeeding segment also black; two subfuscous spots on pleura posteriorly beneath base of wing, and a strong dash of black on posterior coxal plate.

Eyes black; vertex and front punctured, somewhat shining on triangular area; third antennal joint disciform, arista black; dorsum of thorax clothed with fine grayish pubescence which glistens on the

black stripes, a fringe of black bristles extends along each side; scutellum regularly rounded behind, nearly as long as the width.

First and second costal sections of the wings about equal in length; the third and fourth together equal to one of the preceding; third and fourth longitudinal veins parallel. Length, 1.75 mm.

According to Dr. C. F. Adams' table of *Oscinis*, this specimen runs to *nuda* Adams, but it appears as a form too extreme to be regarded even as a variety on account of the following differences: no sharp definition of vertical triangle; vittæ of thorax black instead of brown, and three in number instead of four; no additional line above base of wing unless extremely obscure; black spot lacking above middle coxæ, but two faint or obscure maculations on pleura; scutellum lacking apical pair of bristles, wholly bare, (may possibly be denuded, however); fore margins instead of hind margins of abdominal segments black; tips of tarsi not black; third section of costa more than one-half as long as second section.

***Oscinis frontalis* n. sp.**

Texas.—Plano, Collin county; one female specimen collected in May at dusk in oat field, and one male in November, 1907. Types deposited in the U. S. National Museum.

Generally yellow; front dull, thorax with sericeous pubescence, abdomen somewhat shining. Vertical triangle impressed, not quite reaching to the antennæ, a black dot enclosing the ocelli, and a second dot beneath the ocellar spot in the frontal triangle of the male; hair of front black and stubby, suggestive of minute bristles; arista black. Eyes black with slight pale pubescence.

Dorsal vittæ four in number, brownish black on the female, black on the male, the middle pair but slightly parted and shorter than the lateral ones, all failing to reach the posterior margin of the mesonotum; an additional short narrow stripe above the base of the wing. Lateral suture of pleura strongly lined with black, and a short black dash runs above each posterior coxa. Scutellum evenly rounded, bearing a few black bristles, the apical pair stout. Similar black bristles fringe each side of the mesonotum, and a pair arises near the posterior margin of the dorsum, each bristle standing at the distal end of a lateral stripe.

Metanotum shining black; abdominal segments infuscated at base, the female being more suffused with a dark cast especially overspreading the middle; anterior edges of second segment with a distinct small black dot; venter immaculate; protruded tip of male genitalia and of ovipositor of female black; claws black.

Wings clear hyaline, second costal section twice the length of third section, third and fourth longitudinal veins parallel. Length, 1.5 mm.

Although running to *O. ovalis* Adams, these specimens differ particularly by reason of the double length of the second compared with the third costal sections of the wings, and by the rather unusual appearance of an almost bristly front.

***Oscinis dissidens* n. sp.**

Texas,—Plano, Collin county; June, 1907, one specimen taken in an experiment cage in oat field. Type deposited in the U. S. National Museum.

Mostly shining black; face below the frontal triangle, together with the oral region and mouthparts, excepting the palpi, venter of abdomen largely and dorsal base obscurely, knees of anterior and middle legs slightly, tibiæ of middle legs obscurely, all trochanters and the tarsi except at tip, and halteres, yellowish. Frontal triangle extending across the vertex, polished, reaching two-thirds of the distance to the antennæ, adjoining outer edges of front dull, front projecting over the antennal insertions. Antennæ dull opaque, third joint inwardly sericeous, arista pale and faintly pubescent. Mesonotum with faint pale pubescence, two fine sulci running forward from posterior margin, scutellum with a pair of small terminal bristles.

Wings clear, first and second costal sections equal in length, third and fourth longitudinal veins parallel. Length scarcely more than 1 mm.

Runs to, and agrees in many respects with *O. obscura* according to Mr. Coquillett's description, but the following distinguishing features are noted: greater part of the front yellow, tibiæ of fore legs black instead of yellow, and the second longitudinal vein joins the costa at more than half the distance instead of midway between the apices of the first and third longitudinal veins.

---

## Notes on the Psychodidae.

By LEONARD HASEMAN, University of Missouri.

Since the completion of my monograph of the North American Psychodidæ, which appeared in the Transactions of the American Entomological Society, Vol. XXXIII, I have been carefully watching for any new species and life histories which may turn up in this region.

The extreme minuteness and inconspicuousness of the adults, as well as the immature stages of these flies, makes their discovery in nature possible only by very close and persistent ob-

servations. While I have secured a number of my species on shaded windows and vine-clad walls of buildings, I have had far better results collecting the adults at night when they are readily attracted to lights. I have secured all my life histories by preparing vegetable cultures, in which they breed in great numbers. The past year two new life histories have been found, one of which proves to be that of a new species. A number of specimens collected between March 20 and June 20 have been identified as *Ps. schizura* Kin. Their wing length varies from 1.8 mm. to 2.8 mm., and they all have the black tufts at the tip of the veins and the alternate black and white markings which give the wings a mottled appearance. A few specimens collected between April 18 and May 24 have been identified as *Ps. cinera* Bks. This species has also been found fairly common in the caves of Indiana by Mr. A. M. Banta,\* so that it probably appears over the entire range from the Atlantic to the Pacific.

Early in the spring of 1907 I collected a quantity of dry weeds and grass, and also some green grass and curly-dock leaves, which were put into two large square glass jars, covered with water and placed in the insectary to thoroughly ferment. In a short time mosquitoes appropriated the jars for their use. The adults and larvæ of the mosquitoes were collected and destroyed, and glass covers placed over the jars for a time. Later the covers were removed and early in June adult Psychodids were found in one of the jars. The cover was replaced on this jar and a large brood of adults appeared on the 13th of June. This jar was fairly teeming with them, while the other, which stood by its side, contained none at all. The first brood of larvæ and pupæ escaped my observation, but on the 15th of July a second brood of larvæ appeared, when the jar was removed to my laboratory and daily observations made on the habits of the larvæ, pupæ and adults. After the first adults were found in the jar, it was kept covered except when specimens were being removed. In this way five broods were reared during the summer. The adults of the first brood appearing June 13-20, the second July 17-20, the third August 8-12, the

\* Carnegie Institute of Washington, publication No. 67, p. 84.

fourth August 20-27, and the fifth September 10-15. The broods gradually decreased in numbers of individuals until there were very few to appear in the last brood. The food supply began to get scarce after the second brood, and decaying potatoes were added, for which the larvæ showed great fondness.

The second jar, containing the decaying vegetable culture, was left standing uncovered in the insectary all summer. The mosquitoes did not return to it and no signs of Psychodids appeared in it. The water nearly all evaporated, so that by the first of December only a small quantity of water remained in the bottom to keep the grass and weeds moist.

While rearranging the insect breeding cages on December 9, I was surprised on lifting up the jar containing the culture to see a half dozen or so adult Psychodids fly out of it. The jar was immediately covered and removed to my laboratory. On the following day a few more adults emerged, but by the most careful examination no larvæ or pupæ could be found. A number of the adults were collected and mounted, while the rest were left in the jar for breeding. The second brood of larvæ and pupæ appeared during Christmas vacation when I was away and on my return the 5th of January, a great many adults were present in the jar. Some of the adults were again collected and others left for breeding. On the 6th and 7th of January the first signs of larvæ were noted. They had just hatched and were extremely small, and unlike the larvæ of the other species I have observed, were very sluggish. The first pupæ from this brood of larvæ were found on the 15th of January and adults began to emerge on the 16th. Only three broods of this Psychodid were reared; the adults appearing Dec. — to Dec. 9; Dec. — to Jan. 6; Jan. 16 to 25. Stragglers from the last brood continued to appear until the middle of February and a few specimens again appeared the last of March.

Returning to the first species, which was bred between June 15 and Sept. 15, I find, on comparing it with *Ps. floridica*\*

---

\*Trans. Amer. Ent. Soc., Vol. xxxiii, pp. 316 and 324.

that a close relation exists between the two forms. My material of *Ps. floridica* has deteriorated considerably, especially the larvæ and adults, so that comparisons in some particular details are made with considerable difficulty.

There is a very marked difference in the size of the Missouri and Florida specimens, the larvæ of the latter being from one-fourth to one-third larger. The difference in size also appears in the pupæ and adults. The Florida larvæ have eight or nine dorsal plates on the posterior annuli of the abdominal segments, while the Missouri larvæ have but six. The Florida larvæ have no ventral thoracic plates, while the Missouri ones have two small widely separated plates on the posterior annulus of each segment. Each of these plates bears two long bristling hairs. In the living Missouri larvæ the internal organs show through the body wall as a broad creamy-white band in the region of the fourth and fifth abdominal segments, which did not appear in the Florida larvæ. These slight but uniformly constant differences convince me that this Missouri Psychodid is not the same as the Florida one, though certainly very closely related. The adults have been compared with *Ps. nocturnalæ* and their similarity in every respect is so great that I feel sure they are the same species. The dates of their appearance also correspond.

I find that my figures of *Ps. floridica* are slightly at fault on the segmentation of the posterior end of the abdomen. In some cases I find that the break between the last two annuli is so marked that I mistook it for a segmental rather than an annular division.

#### LARVA.

The larva is quite slender, cylindrical, measuring 11 mm. in length and .8 mm. in breadth. Each of the three thoracic segments is rather distinctly divided into two annuli. The first abdominal segment also has two annuli, while each of the other six abdominal segments has three. Each annulus of the two posterior abdominal segments has, on its dorsal surface, a small chitinous shield; the third shield of each segment being

the largest. Each of the abdominal and thoracic annuli are well armed with short, closely set spike-like hairs, which are more or less arranged in girdles, due to the annular divisions. Besides these short hairs there are two or four longer curved hairs on the dorsal surface of the posterior annulus of each segment, likewise one or two along the sides of the same annuli, and two pairs of similar hairs on their ventral surface. The paired ventral hairs on the thoracic segments are mounted upon small, widely separated, circular plates, similar to the dorsal plates on the posterior annuli except much smaller.

In living specimens the internal organs in the region of the fourth and fifth abdominal segment show creamy-white through the body wall. This did not appear in the Florida larvæ and is also obsolete in alcoholic specimens. No signs of anal tracheal gills are present. The thoracic air nipples are present on the dorso-lateral portion of the second prothoracic annulus. As in the case of the Florida specimens, these were not seen to be used by the larvæ for breathing.

The larvæ have the greedy habit of engulfing everything that they can get hold of. The alimentary canal is continually distended with food. The internal organs appear very distinctly through the body-wall, especially in case of specimens preserved in alcohol. The protrusions surrounding the anal opening are much more pronounced than in the Florida specimens. A test was made to determine the length of time they could live under water without coming to the top to breathe and the limit was found to be about twenty-four hours, as in the case of the Florida larvæ.

#### PUPA.

The pupæ are found hidden in the debris at the surface of the water, where they are continually kept moist and where they can protrude their thoracic breathing tubes out above the surface. The pupæ are somewhat larger than those from Florida and the abdominal spines are slightly less developed. There is a very marked difference in the size of the male and female pupæ. The latter are both longer and more heavily built. In-

cluding the thoracic breathing tubes, which are quite long and slender, the female pupæ are 4 mm. in length and .85 mm. in breadth.

The spines along the sides of the pupæ are inconspicuous, usually ending in a fine bristle-like hair. On the ventral surface the first abdominal segment behind the tips of the wing sheaths has but a single row of spines. Along the median line are three or four small spines, bordered on each side by one

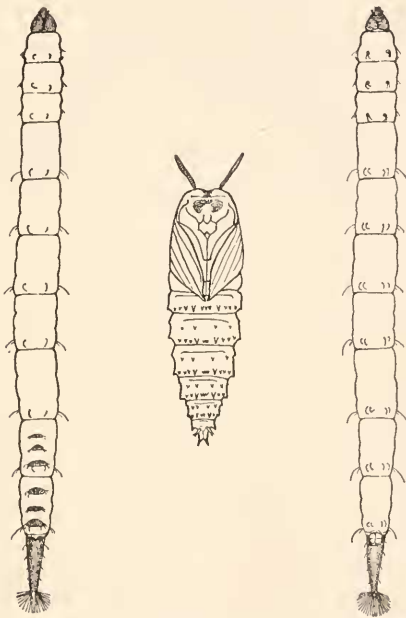


FIG. 1.—Dorsal and ventral view of larva and ventral view of pupa,  
*Ps. nocturnalata* (X 20).

large spine and these in turn by three or four smaller ones, which extend out to the lateral edge of the body. The next four abdominal segments each have two rows of spines. The anterior row on each segment consists of four medium-sized spines, well separated and placed at equal intervals. In the middle of the second row on each segment are three small, closely-set spines, which are bordered on each side by one large



spine and these in turn by three or four spines, which decrease in size laterally. The posterior abdominal segment, viewed from the ventral side, has a basal portion, from the lateral sides of which projects a single strong spine, and from the ventral surface of which project two strong spikes, each of which terminates in two sharp spines. Posteriorly the segment is much constricted and terminates in two pointed spines with a narrow emargination between. Looking at the segment from the side, it can be seen that the dorsal half projects beyond the ventral portion and terminates in two very strong dorsally curved spines.

On the dorsal surface the segments have but a single row of spines. Along the median line of the back the first segment bearing spines has two small closely applied ones, the next two segments each have three and the next two segments each two. Lateral to these closely joined spines on each segment there is one strong spine, followed by three or four smaller ones. On the dorsal surface of the anterior abdominal and the thoracic segments there is usually a single papillæ bearing a fine bristle-like hair.

The dorsal spines curve slightly forward, while those on the ventral surface project backward. These help the pupæ in working their way up through the decaying vegetable material and in maintaining their position when they once get to the surface where their thoracic breathing tubes can be protruded out into the air.

The breathing tubes are very long and slender, with a short, much wrinkled stalk. The trachea can be traced to the very tip of the tube. There are two rows of small, circular foramina on the dorsal surface of each breathing tube. These foramina also surround the tip of the tube and extend some ways down the ventral surface in two rows.

In some cases the segments of the antennæ can be distinguished through the semi-transparent sheath. The ocelli can be seen through the sheath and are arranged in parallel rows extending almost at right angles to the longitudinal direction of the body. Some of the venation of the wings and the seg-

mentation of the tarsi can be distinguished through their sheaths.

Careful observations on the habits of the adults were made. They were often seen to settle upon the surface of the decaying material in the jar as if feeding, but I was unable to decide definitely concerning this; they may have been depositing eggs, as they were usually the large females.

The act of copulation was observed in a number of instances, and a few notes on these observations may be of interest to other entomologists. The males precede the females by a day or two and are very active by the time the females begin to emerge. Mating takes place soon after the females emerge and while they are yet quite sluggish. I have watched the males courting the females by taking a position immediately in front of them, where they remain perfectly motionless for several minutes, except for the continued waving of the antennæ, which are occasionally allowed to touch the antennæ of the female. When the males attempt copulation, they protrude the posterior end of the abdomen forward, much as the small Hymenopterous parasites do when they deposit eggs in plant lice, except that the abdomen is directed forward along the side of the body rather than directly underneath it. After the strong fang shaped male genitalia have firmly grasped the female, the insects turn end to end and have been seen to remain in coition for from one to two minutes. While in coition the wings stand roof-like, the male's being enclosed by the female's, much as in the case of butterflies.

Returning to the second Psychodid which was reared between December 9th and January 25th. This species differs very much from the other Psychodids I have observed. The larvæ are much shorter than the other forms and are broader than deep. The annulation is very distinct. The pupæ are short and plump, slightly broader than deep. The adult has been carefully compared with my other species, and as it does not conform to the descriptions of any of Bank's and Kincaid's species, I have decided that it is a new species.

## LARVA.

The larvæ are extremely sluggish and have the habit of rolling themselves up in the decaying material and feigning death when disturbed. They are not nearly so greedy as the other forms, though they feed almost continuously. Occasionally they leave the culture and climb up along the sides of the vessel by carrying along with them a film of water. Specimens have often escaped from my watch-glasses and crawled about on the table until quite dry, but on replacing them in the glasses they would revive.

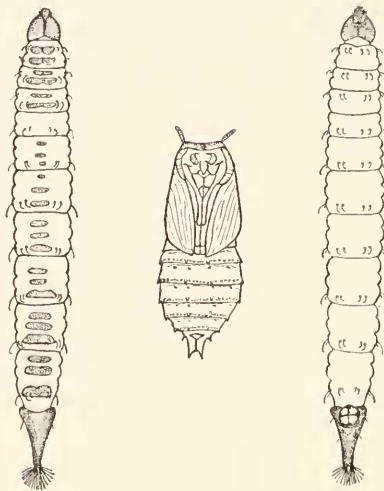


FIG. 2.—Dorsal and ventral view of larvae and ventral view of pupa, *Ps. domestica*, n. sp. (X, 20).

The larvæ attain a length of from 6 to 7 mm. and a breadth of .8 mm., and are slightly flattened. The thoracic segments and the first abdominal have each two distinct annuli, while the next six abdominal segments have each three. Each annulus, with the exception of those of the first abdominal segment, bears a distinct plate on its dorsal surface. There is some variation in the dorsal plates on the first three abdominal segments, and they are usually much reduced, though, as a rule, each annulus of the second and third segment bears a small

plate, and often the anterior annulus of the first segment also bears a plate.

The plates at the posterior and anterior ends of the body are much the larger. The first and usually the second prothoracic and first mesothoracic plates are so cleft from behind along the median line as to form two plates placed side by side. Besides these dorsal plates the body is well armed with very short bristling hairs and a few long ones. The posterior annulus of each abdominal segment bears two pairs of long bristling hairs on its dorsal and ventral surfaces and one or more similar hairs on its lateral margin. The anterior annulus of the thoracic segments bears similar hairs. These hairs are mounted upon low papillæ and are usually curved rather than straight. One or both pairs on the dorsal surface of the posterior segments may be mounted upon the dorsal plates.

The larvæ possess the prothoracic air nipples, as in the other forms. So far as I have been able to determine, these are never used for respiration, unless perhaps when the larvæ leave the water and crawl up the sides of the jar or along on the straws and weeds which extend above the water. At this time they have only a thin film of water around them and the four small projections bearing the cilia which protect the posterior breathing pores are usually retracted so that these breathing pores are closed and at such times air may be taken through the thoracic air nipples.

While feeding and while in the water respiration is carried on entirely through the posterior spiracles. It is interesting to watch this operation. After the larva has been at the bottom of the jar feeding for a while, a small bubble of gas will begin to form at the tip of the breathing tube. This is continued until the bubble has reached a considerable size, when the larva stops feeding, lets go all hold, and rises to the surface much as an aeronaut. On reaching the surface the bubble bursts, the cilia around the spiracles spread out and hold the larva in place until a new supply is drawn into the tracheal system, when the cilia are retracted and the weight of the body of the larva carries it to the bottom of the jar again, where it continues to feed. The fresh air in the tracheal system is

under considerable pressure, so that the supply is not able to float the larva, but as soon as the pressure is released and the gas collects in a bubble at the tip of the tube, its buoyancy is sufficient to carry the larva to the surface. This operation is repeated every five minutes or so, depending upon the activity of the larva.

A test was made to determine the length of time the larvæ could remain submerged. For this purpose a small quantity of kerosene was poured over the water in a small dish and many of the larvæ were found to be still active after being deprived of air for a day.

#### PUPA.

The pupæ are oval in shape and somewhat flattened. They attain a length of 3.5 mm. and a breadth of .8 mm. The thoracic breathing tubes are much shorter than in the other forms, measuring about .25 mm. in length. The abdominal segments are well armed with numerous short, simple and compound spines. On the ventral surface the five segments posterior to the tip of the wing sheaths each has two rows of these spines. The first row on each segment is near its anterior edge and consists of four compound spines, well separated. The second row is near the posterior edge of the segment and consists of from six to nine small compound spines along the median line, bordered laterally by a single enlarged spine, and this followed laterally by a number of smaller ones. The compound spines consist of two or three small sharp spines borne on a low circular papilla. The posterior segment bears on its ventral surface a single strong compound spine, along the lateral edge of its slightly expanded base, while the tip is terminated by two slightly diverging strong simple spines with a broad emargination between.

The arrangement of the spines on the dorsal surface is about the same as on the ventral surface. Each segment has two rows, but the spines of the second row are smaller and more closely set than on the ventral surface. Six of the abdominal segments bear these rows of spines on their dorsal surface,

while only five of them have spines on the ventral surface. The ventral surface of the first segment bearing dorsal spines is hidden by the tip of the wing sheaths. The dorsal portion of the last segment is curved dorsally and ends in two very strong spines. On the dorsal surface of the last segment near the base there are two laterally projecting spines as on the ventral surface.

The breathing tubes are club-shaped, with a short, much wrinkled stalk, and bear two longitudinal rows of foramina along their dorsal surface. The segmentation of the antennæ shows distinctly through their semi-transparent sheath.

***Psychoda domestica* n. sp.**

Body dark brown to black, clothed with long black hair, which to the unaided eye gives the insect a distinct blackish appearance. Thorax lighter than abdomen, and in some specimens the hair has a brownish cast. Legs black with black hairs and scales, the latter on the hind tarsi brownish. Wings long, rather acutely rounded at the tip of second simple nervure; evenly and well clothed with long black hair; posterior fringe black, about one-half the breadth of wing; anterior fringe much narrower; dense tuft of long black hair on base of costa. Anterior furcation one-sixth length of wing nearer tip than posterior; slightly beyond middle of wing. Female wing, length 2.25 mm. to 3.25 mm.; breadth, .75 mm. to 1.00 mm. Male, length, 1.8 mm. to 1.85 mm.; breadth, .65 mm. to .7 mm. Length of antennæ about one and one-half breadth of wing; 16-jointed; 1, slightly longer than broad; 2, spherical; 3-13, with basal enlargements and terminal pedicles, which are slightly swollen in the middle; 14-16, much reduced and closely applied to 13 and to each other; 3-16, with dense whorls of smoky-black hairs; 1-2, with shorter hairs and scales. Male genitalia strongly developed; superior pair about as strong as inferior; two-jointed; basal quite strong, slightly longer than broad; second twice as long as first, slightly expanded at base, weaker distally where it terminates in a very acute claw; inferior genitalia one-jointed, greatly expanded at base, but tapers rapidly to tip, which bears a single long, strong papilla about one-half the length of the segment. Ovipositor and ventral plate yellowish brown; ventral plate broader than long, with broad emargination behind reaching half way to base; ovipositor as long as breadth of plate, much curved; plate and base of ovipositor armed with short hair.

*Habitat*:—Columbia, Missouri; bred in laboratory from December 9th to March 20th.

## Some Observations at Southern Pines, N. Carolina.

By ABRAM HERBERT MANEE, A. M.

### *Strategus antaeus.*

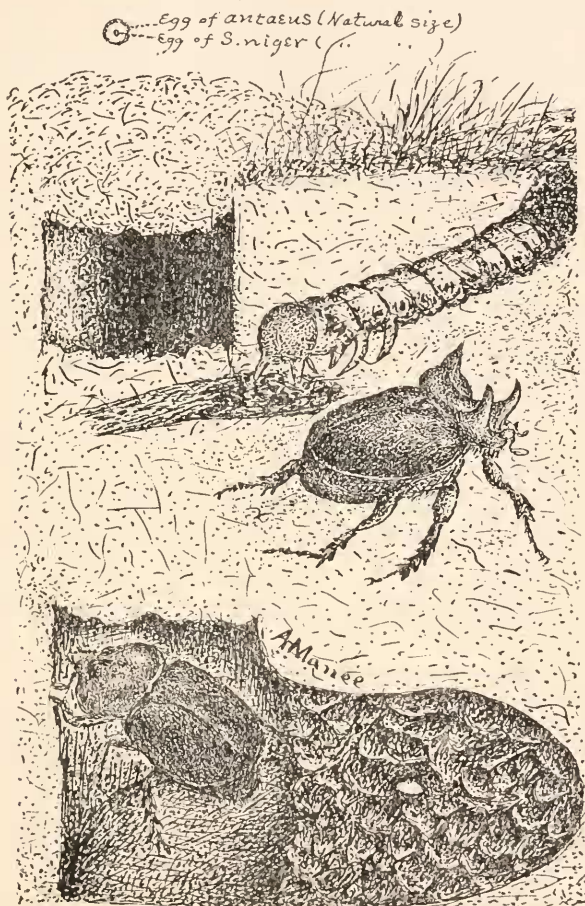
In these sand hills, where the long-leaf pines denude the ground of all but their own litter; in these black-jack barrens, where the many spaces bare among the tufts of wiry grass gleam white in vivid harmony with black and yellow; here, where neither stones nor gravel hinder plunge of trowel, there is free field for study, and in the World of the Little the toilers in the soil incite to special interest.

My first *antaeus*, picked up in winter, were charred by ground fires. In summer, '05, came my first polished males. On the night of July 11, '06, I took my first females by electric light. That same month we investigated an inch hole by a cart path and dug out a working male. July 26 I took my first pair from between two exposed roots of a large oak. They were pulverizing the surface soil, preparatory to shaft digging. After several such takings of pairs and singles, I came to know the peculiar mound of earth always pulverized to a depth of one to three inches. August 3d I dug beneath an old mound and found an egg. August 9th and 14th several more eggs, and I note as follows:

Beneath the mound of loosened soil an inch shaft extends vertically for six or eight inches. At bottom of shaft a one-and-a-quarter inch chamber reaches horizontally from one to five inches, and in this chamber, packed with finely broken bits of decadent oak leaves, a solitary egg is deposited. Sometimes two or rarely three such chambers diverge from the same shaft, but I believe with never more than one egg in each. A favorite haunt for nesting is by a pile of dead oak leaves wind blown in some hollow, from which I conclude that the young larva feeds on leaf debris and later on decadent oak roots.

The newly laid egg is oblong and white, in length fully three-thirty-seconds of an inch. In three or four days the egg swells to globular and is fully one-eighth inch in diameter.

From seven or eight eggs taken August 14th and placed in a jelly tumbler I found on August 25th five larvæ from five-eighths to seven-eighths inches. They had eaten eggshells



Strategus ♂ larva  
 antæus ♀ Egg  
 Fabr. in Nest

and some dead oak-leaf debris. The last larva emerged August 30th—length, five-sixteenths inch; color, white, with head fuscous. In September one larva had become *cannibal* and de-



voured all the other larvae. (This probably accounts for the eggs being deposited solitarily.) October 12th the cannibal larva, less than two months old, had grown from its abnormal feeding to a length of two inches; color: head blackish, legs and spiracles yellow-brown, body whitish, with blue-black showing through, under side and last three segments blue-black.

From August, 1907, three larvæ from eggs were fed separately on dead oak leaves and roots, and at four months were only one inch long, so that the two months old two-inch cannibal specimen was doubtless of abnormal size. It would be interesting to rear a larva-fed *antæus* grub into pupa or imago and note whether it would become a giant specimen or simply mature more rapidly.

*Strategus splendens*, Beauv. This rare species occurs here with a season at least two months earlier than *antæus*. In June and July I find only dead specimens, and a fresh living beetle was dug from my garden January 1st, within a few feet of which I found on the same date an imago which had evidently died just after moulting, as the elytra were abortive.

*Geotrupes balyi*. This species buries not only animal droppings, but decadent fruits. I noted it working under spoiled cocoanut and also under refuse watermelon. Dr. L. O. Howard wrote me that this was a new observation.

*Sandalus niger*. I have discovered what was, I believe, hitherto unproved, that the reddish male of *Sandalus* is a fixed variety of *niger*. Dr. Howard writes me that Dr. Horn, in his synopsis of the genus, suspected this relationship. He wrote also that my dates are interesting, as in the vicinity of Washington, D. C., where *S. niger* is rare, the mating season is not later than August. I note as follows:

"In November, 1904, took two or three living females on dead black-jack oak. In November, 1905, found a few females, and Mr. R. S. Woglum, acting State Entomologist, took one red male, the first found here. In November, 1906, we took twenty females, three black males and two red males. I then suspected that the red males were *niger*, as we found no red females to correspond. In November, 1907, we took forty

females, every one a black-brown *niger*; four black males and fourteen red males. Two of the black males were in sexual contact, and in several instances a red male, sometimes two, were attached to a *niger* female. On warm sunny days the red males were flying. It was exciting to draw one down by a wave of the net when it would descend on an incline and strike the ground like a pebble. If we simply allowed it to reach an oak most surely a female would be found quite near.

The season here for *niger* is October 26th to December 1. On this last date I took a female in the act of ovipositing. The egg is pure white, cylindrical, convex at each end, more than twice as long as wide and so minute (one-forty-fifth of an inch in length) that five lengths would not equal the diameter of the egg of *S. antaeus*.\* The eggs are irregularly clustered in a crack of bark or wood or on under side of loose bark of a dead branch or trunk of black-jack oak and are attached by *silken* or *webby* threads.

The female imago is a full inch in length, entirely nude of hair, with the nine outer segments of antennæ in *short* laminae increasing to the thickened tip. The male is from 11-16 to 13-16 inclusive, in length; pubescent beneath and above especially on face; thorax and base of elytra, and with the nine antennal laminae of equal length, 5-32 inch.

---

MR. E. T. CRESSON, the distinguished Hymenopterist and treasurer of the American Entomological Society, has been in charge of the publications of the Society since 1861, a record of 47 years' unselfish service in the interest of entomology.

H. J. QUAYLE, assistant professor of Entomology in the University of California, will be located at the Southern California Pathological Laboratory, Whittier, Cal., after July first.

ON September 3rd, 1907, I took a perfectly fresh specimen of *Callidryas agarithe* ♂, at Beach Haven, New Jersey; it was found in company with large numbers of *ebule*, of which I took twenty-one males and nine females. Is this not a new record for New Jersey? The specimen was in such perfect condition that it seems impossible that it could have flown up from the South.—W. G. FREEDLEY, JR.

---

\*I estimate that 200 eggs of *S. niger* would equal in bulk one egg of *S. antaeus*, but *antaeus imago* is very heavy and *niger imago* very light. The egg of *Dynastes tityfus* is also small, one-half the diameter of that of *antaeus*.

# ENTOMOLOGICAL NEWS.

---

[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

---

**To Contributors.**—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, three weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form, will be given free, when they are wanted; and this should be so stated on the MS., along with the number desired. The receipt of all papers will be acknowledged.—ED.

---

---

PHILADELPHIA, PA., JUNE, 1908.

---

---

We have touched on this subject before, but would again like to remind our readers that we are not egotistical. To those who so kindly write articles for the NEWS we wish to say that the editors of this journal are the most learned people in the world, and in addition to that are mind readers. Also, time hangs heavy on our hands as we have nothing to do. Don't take the trouble to number the pages of your Ms. as we can do it better. Write botanical names and names of places any old way. We know all the botanical names and have become familiar with all localities, having lived in each one.

When you give measurements of insects, especially new species, you need not write the figures plainly, as knowing everything we can readily decipher them. The names of all new and proposed species are known to us in advance, and knowing them yourself it is not necessary to be particular about how you write them. When writing us you need not be particular about your name and address, as we can read anything. If errors occur just blame us and the printer. The printer, by the way, is a wonder. He reads Russian, Chinese and Sanscrit with greater facility than he does English. The collecting season has begun, so we may be able to forget the editorial department for a time.

P. S.—Don't forget to mix up exchange notices and other matter for the NEWS with personal matter to the Editors.

## Entomological Literature.

STUDIES IN NORTH AMERICAN MEMBRACIDÆ. By Edward P. Van Duzee.

This paper was published in the Bulletin of the Buffalo Society of Natural Sciences Vol. ix, pp. 29-129., issued April 18th, 1908. The author gives the results of a systematic study of all the membracids in his own collection and of material obtained from correspondents. Synoptical tables of the subfamilies, genera and species are given, and also outline figures of many species. At the end of the paper is a list which includes all the species known to exist north of the Southern boundary of the United States. The paper is a very valuable contribution to the subject.

PROCEEDINGS OF THE HAWAIIAN ENTOMOLOGICAL SOCIETY. I part 5.

This gives an account of the meetings with notes and exhibitions, and also contains the address of the President and a paper by G. W. Kirkaldy, entitled "A List of the Described Hemiptera (excluding Aleyrodidæ and Coccidæ) of the Hawaiian Islands."

A REVISION OF THE TENEBRIONID SUBFAMILY CONIONTINÆ. By

Thomas L. Casey. Proceedings of the Washington Academy of Sciences; Vol. x, pp. 51-166.

The Tenebrionid genera, *Eusattus*, *Coniontis*, *Coelus*, *Branchus* and *Praocis* and others, are considered, and new genera and many new species are described in this paper.

DIRECTORY OF JESUIT NATURALISTS.

Frederick A. Hillig, S. J., has compiled and published a pamphlet of 34 pages under this title in No. 4 of Vol. II. of St. John's College Quarterly, St. John's University, Toledo, Ohio, April, 1908. The names (arranged alphabetically), addresses, specialties in natural history, desiderata and oblata of 108 members of the Society of Jesus throughout the world are given, followed by indices arranged according to specialties and to countries of residence.

---

## Notes and News.

### ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

THE EGGS OF INSECTS OF THE LAKES OF CHALCO AND TEXCOCO, IN THE VICINITY OF MEXICO CITY AND THE FORMATION OF OOLITHS.—M. L. Cayeux has a brief article on this subject in a publication not likely to be consulted by many entomologists—the recently issued *Compte Rendu* of the 10th Session of the International Geological Congress, held in

Mexico City in September, 1906, and published in that place under date of 1907, received in Philadelphia in March, 1908. M. Cayeux discusses (in French, pp. 1223-1227), first, the geological portion of a communication of Virlet d'Aoust "on the eggs of insects serving as food for man and giving rise to the formation of ooliths in the lacustrine limestones of Mexico" (Compte Rendus, Acad. Sci. Paris, vol. 45, p. 865, 1857). Then, on the basis of material furnished him by the Mexican Geological Survey he concludes: It is undoubted that the egg of an insect, entire or broken, is a centre of concentration for the limestone of the lacustrine sediment and that it determines the formation of innumerable small, irregular nuclei, but in truth it does not form an oolith properly so called in the Mexican lakes. The globules which result from the molecular concentration of carbonate of lime around the eggs have the morphological characters of ooliths. They possess, when they are complete, a central voluminous nucleus, in which are to be found all the elements of the lacustrine sediment, and a non-differentiated thin and irregular cortical zone. In white light, one never discerns concentric or radiate structure; in polarized light, the extremities of a well-marked black cross are often observed. As they are to-day, these globules constitute a new and highly interesting category of *false ooliths*, that is corpuscles which to the naked eye are not to be distinguished from true ooliths and which arise—according to the sedimentation—either by partial crystallization of a limestone sediment or by concentration of carbonate of lime around foreign bodies. The false ooliths in process of formation in the neighborhood of Mexico City are essentially different from ooliths with concentric structure so widespread in the primary and secondary rocks. However, the lacustrine and brackish water deposits of the tertiary may contain some elements of the same origin. The microscopic study of this terrain is too little advanced to affirm that this category of pseudo-ooliths is not represented there.

[Neither M. Cayeux nor M. Virlet d'Aoust mention the species of insect concerned. Perhaps the eggs are those of *Corixa* referred to in many text books of entomology.]

ANNOUNCEMENT.—The Lake Laboratory, maintained by the Ohio State University, announces the usual program for the coming summer, including courses in General Zoology and Botany, Entomology, Ornithology, Experimental Zoology, Comparative Anatomy, Ecology, Embryology, Invertebrate Morphology and Ichthyology also opportunities for research work and accommodations for investigators as in previous years. The staff will include, besides the Director, Professor E. L. Rice, of Ohio Wesleyan University; Professor Lynds Jones, of Oberlin; Professor Charles Brookover, of Buchtel College;

Professor M. E. Stickney, of Denison University, and W. B. Herms, at present Fellow in Zoology at Harvard University.

The opportunities offered are especially good in Entomology, and special attention is given to the aquatic life of the locality. Opportunities for research work in this line are very favorable. Independent investigators are given the use of tables free of charge, but are expected to furnish their own microscopes and other apparatus. The locality is an excellent one for summer work, the laboratory being situated on the point separating Sandusky Bay and Lake Erie, with its frontage on a fine beach.

For circulars or detailed information, letters may be addressed to the Director, Professor Herbert Osborn, Ohio State University, Columbus, Ohio.

To THOSE interested in exotic Rhopalocera the following note may be of interest: On the 19th of December, 1903, I took a fine male of *Ornithoptera pegasus* at Garoet, Java, which locality is nearly one thousand miles west of the western limit for species of the "priamus" group. The specimen was taken in a narrow native trail through the jungle at the foot of the Papandajan, an active volcano less than ten miles from the town of Garoet.—WILLIAM G. FREDLEY, JR.

#### A MOSQUITO LULLABY.

Hush, little skeeterbug, hush a-by,  
Mother will rock him, don't you cry!  
I know you are hungry, my little sweet,  
With nothing to drink, and so little to eat,  
The natives are tough, and their blood is thin,  
But the city folks soon will be rolling in—  
Hush, little buzzer, go by.

Hush, little skeeterbug, hush a-by,  
Think of the summer time, just you try!  
Chubby old ladies and thin old boys,  
Plump little children and, joy of joys,  
Fat little babies, all fresh and sweet,  
And juicy and lovely for you to eat.  
Hush, little buzzer, go by.

Hush, little skeeterbug, hush a-by,  
Soon you'll be ready to buzz and fly.  
Father will sharpen your dear little bill,  
And mother will teach you to bite, she will!  
Maybe they think we are slow and dumb,  
But we are not afraid of petroleum!

Hush, little buzzer, go by.—From *Chicago American*.

## A HAPPY FAMILY OF BUGOLOGISTS.

TO THE CHIEF OF THE BUREAU OF ENTOMOLOGY, DOCTOR L. O. HOWARD.

WITH THE CONSENT OF DR. DYAR.

In 1878 when first we started the long strife  
 Against the tribe of bugs, against their life,  
 We kept the war up hot and bitter,  
 To exterminate the nasty critter,  
 Who claimed the world to be his own;  
 In every land in every zone.  
 At last, we found, we were too few,  
 To cope with this audacious crew,  
 But at this stage! we did expand,  
 Our progeny now claims the land!  
 We raised a family large and bold,  
 Which, with firm grip, and a fair hold,  
 Fights all our battles without fear,  
 Against all bugs though far or near,  
 We may, therefore, be justly proud!  
 Of such a bright and brilliant crowd.  
 Since then, some bright lights passed away,  
 While others went off, far astray,  
 To spread our doctrine here and there  
 Without a favor or a fear!  
 We have become a mighty tribe,  
 In woods, in barrens, and waste land!  
 Wherever we may be on hand.  
 We kill the lice, we kill the bugs,  
 But are quite careful of the frogs,  
 Who always prove a friend in need  
 When bugs are plentiful for feed.  
 We trap the skeeter in his lair,  
 When the sky is clear and fair,  
 Because we know he has a chink  
 Which we detect just in a wink.  
 It's well, therefore, our offspring grow  
 To give fraternity a show.  
 Times are so hard, these days of zest!  
 It's well to take a little rest,  
 To gather lots of pent up steam,  
 To bottle up another scheme  
 But! since it is now rather late,  
 And while the balance points at fate,  
 It's time for all to go to rest  
 To stand the strains of coming test.  
 We therefore humbly do resign!  
 To efforts of the laws sublime.

*Washington, D. C.*

THEODORE PERGANDE.

JULY, 1908.

# ENTOMOLOGICAL NEWS

Vol. XIX.

No. 7.



Halter americana Cockerell.

---

EDITOR :  
HENRY SKINNER, M. D.  
PHILIP P. CALVERT, Ph.D., Associate Editor.

---

ADVISORY COMMITTEE :  
EZRA T. CRESSON.                      HENRY L. VIERECK.                      J. A. G. REHN.  
PHILIP LAURENT.                      WILLIAM J. FOX.                      H. W. WENZEL.

---

PHILADELPHIA :  
ENTOMOLOGICAL ROOMS OF  
THE ACADEMY OF NATURAL SCIENCES,  
LOGAN SQUARE.

Entered at the Philadelphia Post-Office as Second-Class Matter.



# ENTOMOLOGICAL NEWS


Published monthly, **excepting August and September**, in charge of the Entomological Section of the Academy of Natural Sciences, Philadelphia, and the American Entomological Society.

**ANNUAL SUBSCRIPTION, \$1.00 IN ADVANCE.**

Outside of the United States and Canada, \$1.20.

**SINGLE COPIES 15 CENTS**

**Advertising Rates:** 30 cents per square inch, single insertion; a liberal discount on longer insertions. No advertisement taken for less than 60 cents—Cash in advance.

 All remittances should be addressed to ENTOMOLOGICAL NEWS, Academy of Natural Sciences, 19th and Race Streets, Philadelphia, Pa.

## FROM CUBA

### PAPILIOS

<i>Papilio devilliersi</i> , male.....	\$3.00
“ <i>celadon</i> , male.....	.75
“ <i>andraemon</i> , male.....	.30
“ “ female.....	.40
“ <i>oviedo</i> .....	.40
“ <i>caiguanabus</i> , male.....	1.25

### SPHINGIDAE

<i>Amphonyx antaenus</i> .....	\$1.25
<i>Pseudosphinx tetrio</i> , male.....	.25
“ “ female.....	.50
<i>Ambulyx strigilis</i> .....	.35
<i>Philampetus lycaon</i> .....	.40
<i>Cocytus duponchelii</i> .....	.40
<i>Pachylia vesimensis</i> .....	.25
<i>Phlegethontius rustica</i> .....	.25

The specimens are all in perfect condition, in papers

Extra fine perfect specimens of *Phyllium siccifolium* (leaf insects) from Ceylon, \$1.00 each

Send 12 cents additional with each order to cover postage and packing

**JOHN H. MATTHEWS, 3219 N. 13th Street, PHILADELPHIA, PA.**

## ARIZONA INSECTS.

Will collect in most orders or families or season's catch. Also in botany, especially cactii and herpetology—reptiles and amphibians if notified early in the season. Agent for sale of Coleoptera, Mr. L. H. Joutel, 164 E. 117th St., New York City.

**DR. R. E. KUNZE, Phoenix, Arizona.**

## CATALOGUE OF THE NEUROPTEROID INSECTS

(EXCEPT ODONATA)



OF THE UNITED STATES

BY NATHAN BANKS

Complete to Summer of 1907

Price 50 cts. (net) per copy

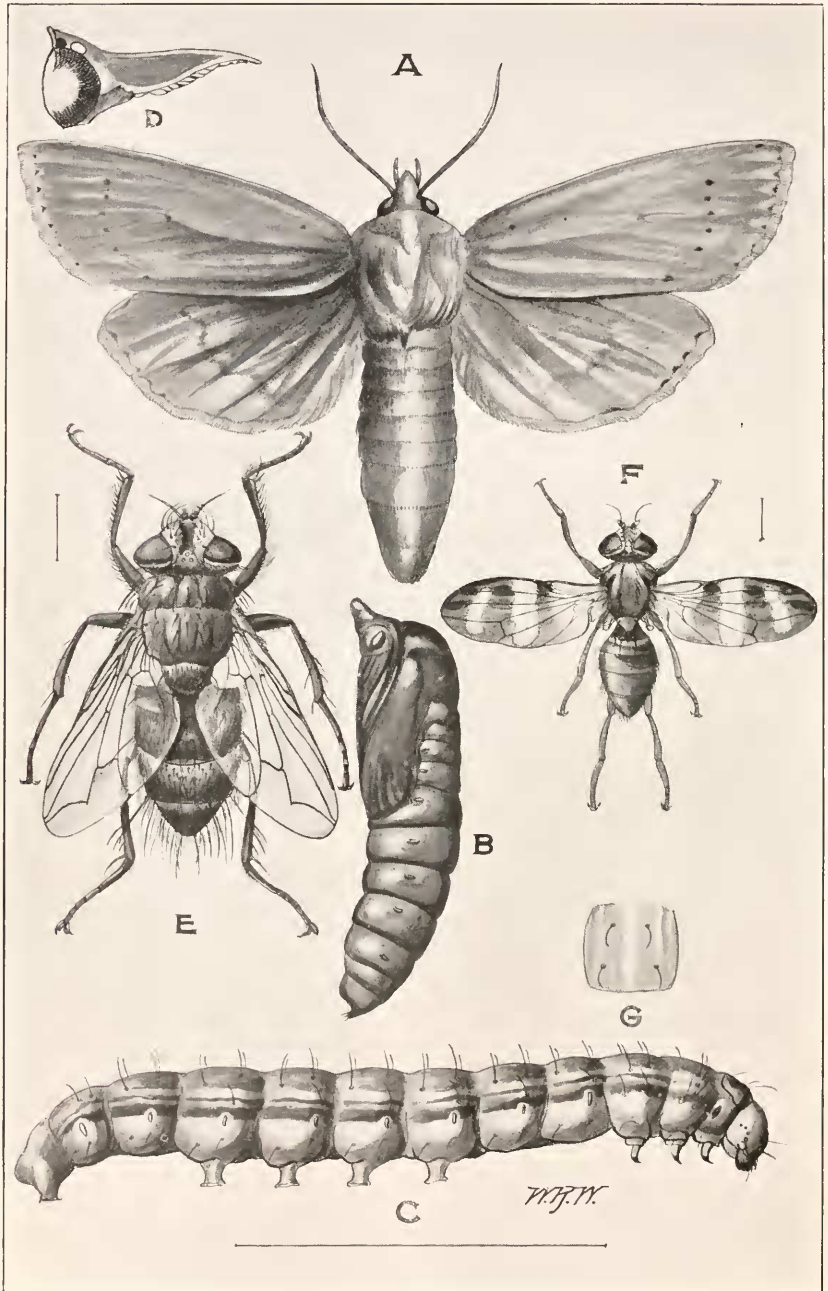
Mailed on receipt of price

 Send for copy of New Additions to   
Price List; just issued.

**E. T. CRESSON, Treas., P. O. Box 248, Philadelphia, Pa.**

When Writing Please Mention "Entomological News."





NONAGRIA OBLONGA GROTE.

# ENTOMOLOGICAL NEWS

AND

## PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. XIX.

JULY, 1908.

No. 7.

### CONTENTS:

Walton—Notes on the Life History of Nonagria oblonga Gr.....	295	Busck—Descriptions of two new Gele- chidae from California.....	316
Smith—A new Mellinus .....	299	Schaeffer—New Coleoptera, with notes on some New Jersey Histeridae....	318
Williamson—Three related American species of Aeshna (Odonata) (con- tinued from page 264) .....	301	Patch—Crocigrapha normani Grote ...	321
Marlatt—Aspidiotus ancylus Putnam vs. circularis Fitch .....	309	Cockerell—Bees of the genus Nomada, belonging to the group of N. de- pressa Cresson .....	323
Pearsall—Eupithecia miserulata Grote	312	Paxson—Numerical Distribution of Some Insects .....	324
Coolidge and Newcomer—The Life History of Pontia castoria Reakirt	314	Editorial .....	338
Grossbeck—Plagodis schuylkillensis: a new Geometrid.....	315	Entomological Literature .....	339
		Notes and News.....	339
		Doings of Societies .....	342

## Notes on the Life History of *Nonagria oblonga* Gr.

BY W. R. WALTON, Harrisburg, Pa.

(Plate XII)

Early in the spring of 1907 the writer discovered evidences of the larva of a lepidopterous insect boring in the stalks of the common cat-tail rush (*Typha*) at Harrisburg, Pa. After a diligent search, a dead larva, much discolored, was secured and also the remains of a pupa shell which was within the burrow of the insect; these burrows were considerably more than a quarter of an inch in diameter and extended from 8 to 14 inches above the surface of the ground, leaving in most instances only a thin wall of tissue to support the stalk of the plant.

As the weather for some weeks after this was unusually cold and stormy, no further observations were attempted until June 10th, when a search was instituted in hope of securing the larva above mentioned. We were soon rewarded in finding it in several stages of growth within the stem of the plant.

From all appearances the larva feeds for a time on the sheath of the stem, as the smaller ones were doing at this time. As it increases in size it bores directly into the succulent central shoot, where it afterward remains until emerging as a mature insect.

On the date above mentioned the smallest larvae found measured less than one-half an inch in length, while the largest were fully an inch long.

Several of the larvae were kept under observation until nearly full fed, when they were removed to a cage and soon after pupated, the first pupa appearing on July 6th, the adult of which emerged July 18th, in the evening.

By July 21st nearly all the larvae to be found in nature had finished pupating, but two full fed larvae were secured on that date. The last larva in captivity pupated on July 28th and emerged on August 17th. The pupal period in this locality seems therefore to vary from 12 to 20 days, most of the moths however appeared in from 18 to 20 days after pupation occurred. In all, some seventeen adults were reared. The moth was identified by Dr. H. G. Dyar as *Nonagria permagna* Grote, but as Dr. J. B. Smith has shown Grote's *permagna* and *oblonga* to be synonymous\* we assume that *oblonga* takes precedence.

The life history of this moth has been given by Prof. Kellcott in Bull. Buffalo Society of Nat. Sci., Vol. 5, p. 40, 1885, under the name of *subcarnea*; this Dr. Smith has also shown to be a synonym of *oblonga* Grote.

Dr. W. J. Holland, in the "Moth Book" (my copy bears the imprint of the year 1905 on the title page), says "This is a southern species thus far only recorded from Florida," which is certainly an oversight, as Smith records the species from New York, New Jersey, Maine, Illinois and California.

The larva of the moth is quite two inches in length when mature and of a pale yellowish color with flesh-colored stripes; it is bare save for a few bristles upon the back and sides.

The pupa is a bright chestnut color when new, but grows much darker as the time of emergence approaches. The moths of the genus *Nonagria* are peculiar in that they possess a clypeal spine, which is used by them in penetrating the thin covering left by the larva to conceal the mouth of the tunnel.

The pupae show the development of this spine very plainly, as may be seen in the illustration. A side view of the head of the female moth is also shown which is redrawn from Smith.

---

\*Proceedings Ent. Soc. Washington, Vol. V, No. 4, p. 315.

I have been unable to find any record of the insect having been taken in Pennsylvania before, although Dr. Smith records it from several neighboring states and says "It is quite probable that the species will be found throughout the United States wherever the food plant (*Typha*) occurs."

The situation in which the larvae were found consists of a series of shallow pools, caused by the removal of clay for the use of a brickyard in operation nearby. These pools are bordered with the cat-tail rushes upon which the caterpillars subsist; the total area of the rush patches combined was something less than one acre in extent, but I am given to understand that the swampy tract has been in existence for over twenty years. Its elevation above sea level is almost precisely 400 feet, as shown by the city engineer's levels.

Usually not more than a single adult larva is found in a stalk, but in a few instances more were found; in one instance two healthy pupae were found in one stem. The plants in which the insects mature do not bear any fruit, as the injury inflicted is a most serious one, the central shoot dies and turns yellow and the infested plants can be singled out quite readily by this sign toward the approach of the time of pupation.

Fully 75 per cent. of the plants in the marsh seemed to be infested, but some animal seems to have a special fondness for the fat pupa, as more often than otherwise it had been extracted through a hole broken in the side of the stem. In some cases this seemed to be the work of a rodent, judging from the droppings that were found about such places. Observations lead me to believe that this species does not feed below the water line in its burrows. In cases where the water had receded from the base of the plant, the larva invariably descended to the very crown. But I was unable to discover a single case in which the insect went below the water line where water was actually present.

The moth is apparently not much attracted to light, as was shown by the fact that although collections were made almost nightly at a light not more than 100 yards from where the moths were emerging, not a single specimen was taken in

this manner. Prof. Smith, however, records at least one instance in which it was taken at light. The moth resembles the color of the dead rushes so closely that it was unnoticed even in breeding jars for some time, and when sitting with the wings closed it resembles a swelling on the stem quite closely.

During the rearing of the above-mentioned species, two species of Diptera were bred from its habitations that seem to bear a definite relation to its life-history; one, a Tachinid, was reared from the larva of the insect.

This fly is figured herewith and Mr. C. H. T. Townsend, who examined it through the kindness of Dr. Howard, determined it to be a species of *Ceromasia (Masicera)*.\* The fly was bred from two separate groups of larvae taken at an interval of a week or so apart, one lot emerging on July 20th and the other on the 26th. Another fly which was reared from the tunnels in large numbers and which was found to inhabit the majority of abandoned burrows, is the Ortalid fly *Chaetopsis aenia* (Wied.), which is also the *Ortalis trifasciata* described in Say's complete works.

Dr. Howard states that he has reared the fly from corn-stalks; it has also been reared from sugar cane, and there is one instance on record in which it is supposed to have caused considerable injury to growing oats. However, I found no evidence to show that the fly fed on any but stalks that had been previously attacked by other insects. I notice two varieties of *C. aenia* bred from the same stems of *Typha*, both of which are spoken of by Loew in his "Monographs." One of them has the legs entirely yellow, while the other has a considerable amount of black upon the femora. They seem to be very generally infested with small mites which are especially numerous on the head of the fly and which remain on the same even when dried in the cabinet. I have noticed specimens of *Muscina stabulans* similarly infested and have recently taken a very small Phorid that was literally alive with equally minute mites.

---

\* The species seems to agree in every way with Coquillett's description of *Masicera myoidaca* (Desv.), which has been reared from the larva of *Hydroecia nitela*.

## DESCRIPTION OF PLATE XII.\*

- A. *Nonagria oblonga* (female), enlarged 2 diameters.
- B. Pupa of same (female), enlarged 2 diameters.
- C. Larva of same (female), enlarged 2 diameters.
- D. Side view of head of female moth. Redrawn from Smith.
- E. *Ceromasiu sp.*, enlarged 4½ diameters.
- F. *Chaetopsis aenia*, enlarged 4½ diameters.
- G. Dorsal view of abdominal segment of larva.

---

### A new *Mellinus*.

BY HARRY S. SMITH, Lincoln, Nebraska.

A few weeks ago while working up the Nebraska species of *Mellinus* contained in the University collection, the writer came across a specimen from Indiana which appeared to be undescribed. Knowing that the collection of the American Entomological society was practically complete in this group, the specimen was sent to Mr. H. L. Viereck for comparison, who stated that it represented a species distinct from any in the above mentioned collection, where to his knowledge were all known species from America north of Mexico excepting *obscurus* Handlirsch, a description of which he very kindly sent me. The species is characterized as follows :

***Mellinus wolcottii* n. sp.**

♀. Length, about 9 mm. Head short, transverse; cheeks, occiput, vertex and front with punctures extremely minute, and so close together as to appear granulate, rather dull; distance between posterior ocelli slightly greater than that between them and the inner eye margins; face and clypeus finely punctured, the latter with the anterior margin sinuate on each side of the median produced lobe, which is equal to slightly more than one-fourth of the width of the entire clypeus, and squarely truncate; clypeus with about a dozen rather long hairs on its disk, the produced lobe fringed with hairs anteriorly; upper portion of front showing short golden pubescence when viewed at the proper angle. Propleura punctatostriate, collar rounded at the sides. Mesonotum finely and closely punctured; a rather strong carina bounding the insertion of the anterior wings above; scutellum and postscutellum finely punctured, each with a rather large pit or fovea at each side; mesopleura and mesonotum finely and closely punctured as mesonotum; episternal groove strongly impressed and foveolated the entire length. Enclosed basal portion of metanotum U-shaped as in some species of *Alyson*, closely and finely punctured and somewhat shining; metapleura punctured as mesopleura or more sparsely so;

\* Enlargement indicated is for a reduction to ¼ inches in diameter.



posterior portion of metathorax somewhat roughened. Abdomen smooth, almost impunctate excepting apically and ventrally, where rather strong punctures are to be found, but the disks of these segments are practically impunctate; last ventral segment with a longitudinal keel or carina; dorsal surface of pygidium with large coarse punctures, the intervening spaces with minute ones.

Coloration: Ground color of insect black, the following areas deep yellow: Mandibles except tips, clypeus, face below and between antennæ, inner orbits rather widely up to level of anterior ocellus, scape and pedicellum beneath (flagellum missing), collar above posterior portion of tubercles, part of tegulæ, a median spot on scutellum and postscutellum, a large ovate spot on each side of the third abdominal segment, a small lateral spot on four, a rather wide band on five narrowed laterally. The legs are colored as follows: Anterior coxæ, trochanters, femora and tibiæ in front, and tarsi, yellow; intermediate coxæ and trochanters with a yellow dot, femora and tibiæ in front, yellow, tarsi rather darker; hind legs entirely brownish. Wings hyaline, iridescent, nervures dark brown.

*Type*—A female taken at Beaver, Indiana on August 17, 1894. I take pleasure in dedicating this species to Prof. Robt. H. Wolcott, M.D., collector and donor of the specimen, who has added many valuable insects to the University collection.

The second abdominal segment has two or three tiny yellow spots showing through. Other specimens of the species are quite likely to have these spots more strongly developed, or entirely absent.

In order that students may have no difficulty in placing this species, the following modification of the latter portion of Fox's synopsis (*Entomological News*, V, p. 201, 1894) is submitted.

4. Clypeus, except fore margin in male, metathorax, petiole and second abdominal segment, without yellow markings; third abdominal segment with a yellow mark on each side; in the male the scape and first two joints of the flagellum beneath, yellow.

**bimaculatus.**

- Clypeus entirely yellow (male unknown) . . . . . 5.  
5. Two marks on basal portion of metathorax, basal half of first abdominal segment and maculations on second and third segments of abdomen, yellow (remaining segments without yellow)

**alpestris.**

Metathorax and first abdominal segment without yellow maculations; segment four with a small lateral yellow spot, segment five with a continuous laterally narrowed band. . . . . **wolcottii**

## Three related American species of *Aeshna* (Odonata).

BY E. B. WILLIAMSON.

(Continued from page 264)

### *Aeshna multicolor* Hagen.

It is unnecessary to repeat descriptions and bibliographical references (see Calvert, Biol. Cent. Amer., Neur., p. 183). The range of the species is from Panama through the Mexican highlands into the Southern United States (headwaters of the Rio Grande and Pecos), and along the Pacific coast from Lower California to Victoria and Kootenay, British Columbia. Mr. Henshaw has kindly sent me photographs of five specimens labelled *multicolor* in the Hagen collection. As I surmised from the venation and as Professor Walker has recently certainly determined, two specimens, one from the Upper Missouri and one from the Yellowstone, represent two other species than *multicolor*. A male from Toluca, Mexico, collected by Dr. Calvert is here referred to *multicolor*. The T-spot on the frons is slightly wider, the first lateral thoracic stripe is somewhat narrower, the thorax is less robust, and the inferior appendage is shorter (not reaching the apex of the dorsal carina of the superiors) than in typical *multicolor*. The dorsal thoracic stripes, the color of abdomen, so far as can be definitely determined, and the superior appendages are typical *multicolor*.

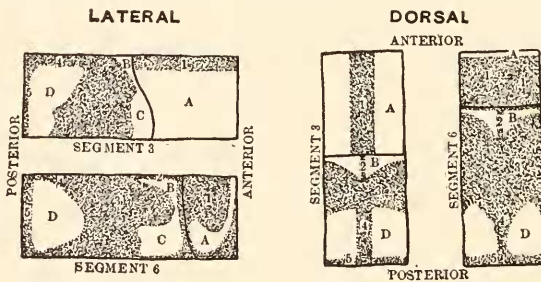
As to the habits of *multicolor* little has been published. Mr. Currie (Proc. Ent. Soc. Wash., Vol. V, 1903, pages 299 and 300) has described the conditions at Williams and Winslow where *multicolor* was taken. From the coloration and robust form one might infer that *multicolor* is a sun-loving species, on the wing during the hottest part of the day, and frequenting still bodies of water (ponds or marshes).

### *Aeshna mutata* Hagen.

Since its description (Neur. N. Amer. p. 124) by Hagen, no further attempt was made to identify this species until it was placed as a synonym under *multicolor* by Calvert in Biol. Cent. Amer. Neur., p. 183. Mr. Henshaw kindly sent me a photograph of the type (an imperfect female) which I identified as

the same as the species I had taken at Bluffton, Indiana. Later Professor Walker compared an Indiana female with the type (which has only North America for locality) and pronounced them identical. At an earlier date Professor Walker had sent me two ♂ and one ♀, all teneral, of the species from Wilbraham, Mass., taken June 5, 1902. My specimens were taken at Bluffton from June 23 to July 13, 1907, 22 ♂, 1 ♀, all adult.

*Color in life* ♂.—Pale markings throughout, and eyes and face pale blue; rear of eyes shining black. Dorsal thoracic stripes 4 mm. long, 1 mm. wide at narrowest point, widened above and below, nearly meeting at the mid-dorsal line at the antealar sinus. Lateral stripes undivided, the first 1 mm. wide below, wider and diffuse above, the upper extremity about 3 mm. wide; second stripe about 1 mm. wide, the anterior (upper) edge nearly straight, the posterior (lower) edge less regular, the extreme upper end of the stripe wider. Abdomen:\*



**AESHNA MUTATA ♂**

Segment 1 brown, a dorsal apical spot and sides below apically, blue; segment 2 blue, above basally, as far as the transverse carina, brown continuous with the brown on 1, a dorsal blue streak through this brown, a transverse brown stripe posterior to the transverse carina and at the apex of the segment; the lower surface of the auricles and a longitudinal streak posterior to them, brown; segment 3 anterior to carina blue (A)† with a dorsal longitudinal brown stripe (1)† con-

\* With post mortem changes the color pattern is often confused or entirely obliterated. So far as my material goes the greatest changes take place in the basal portion of the segments anterior to the transverse carina. In some segments where coloration posterior to the transverse carina is fairly well preserved, anterior to it all trace of color pattern has disappeared in a uniform dull brown.

† These letters and numerals apply to corresponding letters and numerals in the figures representing color pattern of segments 3 and 6.

tinuous with the apical brown ring on 2; posterior to the transverse carina brown (3), with a blue ring interrupted dorsally (2), just behind the carina (B and C), and a wide blue ring (D) interrupted dorsally (4), just anterior to the apical brown ring (5) of the segment, segment 4 similar, brown stripe on dorsum anterior to transverse carina (1), wider, but not quite reaching base of segment, the wide blue interrupted ring near apex of segment (D) reduced in extent; segment 5 with area 1 still wider, 3 longer, 2 and 4 widening and B and D reduced and appearing as spots, rather than interrupted rings; in segment 7 B and C are isolated (A and C together are the "lateral divided basal spot" and D is the "apical spot" of Hagen); in segment 8 B is reduced to two minute spots, C is greatly reduced and A has disappeared; in segment 9 only D remains; in segment 10 variable faint small yellowish spots represent D.

♀.—Mouth parts bluish, labium olive green, anteclypeus plumbeous; above anteclypeus, green obscured with brown, a distinct narrow brown stripe on lower edge of frons in front; frons above dull bluish with black T-spot, which, with its continuation in front of the eyes, is narrowly margined with yellowish; eyes dark greenish-brown, paler below, a distinct narrow posterior green border widening and fading out below; rear of eyes shining black. Thorax with dorsal stripes divided each into a superior and inferior small green spot (described from a single specimen and probably not constant—there is great variation in color pattern of female *Acshna* of the same species); two lateral stripes green, above yellowish; spots between wings green.

Abdomen similar to male, but marked with green,—on first three or four segments the green margined with yellowish, on the posterior segments the green is obscured and drabish. On segment 3 pale areas C and D are continuous laterally, and dark area is wider and darker. On segments 4-7 the dark areas 1 and 3 are on either side reddish brown near their centers, shading out to black at the margins; an extreme apical ring on 8 is pale dull brown; appendages brown.

In Wells County, Indiana, are few remnants of the old swamps which fifty years ago made the chills and ague of this country a constant menace to the early settlers and a perennial joke for those too wise to invade such an inhospitable wilderness. One of these swamps lies southeast of Bluffton, on land owned by three farmers. Two of the farmers are brothers named Vanemon, and the swamp may conveniently be known as the Vanemon Swamp. It is about three miles south of the Wabash River and is completely surrounded by woodland, its very existence being known to but few persons. At some

distance from the swamp the woodland is typical hickory-oak growth. Immediately about the swamp are black ash, elm, pin-oak, red maple and a few sycamores. Willows and button bush fringe the swamp at several points. In the swamp itself *Spartanium eurycarpum* is most conspicuous. At one side is a large area of *Iris versicolor* and Carices abound along the eastern side. There are several areas of cat-tails and spatter dock (*Nymphaea advena*), the latter of which is noticeably increasing its territory. Duckweed (*Spirodela*) is abundant with other floating and submerged vegetation, and in spring the beautiful leaves of the yellow water crowfoot (*Ranunculus delphinifolius*) show splendidly through the clear water. A few years ago *Scirpus fluviatilis* appeared in the swamp and it has now increased to a considerable area. Associated with it is the rice grass, *Homalocenchrus oryzoides*. No other station for *Scirpus fluviatilis* is known for Wells County and a violet, *Viola conspersa*, growing near at hand in the low woodland, is known nowhere else in this county. Along the low area which drains the swamp during its brief period of overflow, *Caltha palustris*, a rare plant here, occurs sparingly.

In early spring dainty crustaceans (*Branchipus vernalis*) in half invisible schools pulsate their aimless ways. The crayfish (*Cambarus acutus*), lives in the swamp and *Cambarus argillicola* burrows in the immediately adjacent woodland. Spotted water snakes drop from the button bushes, the shores are alive with spotted frogs and tree toads (*Hyla versicolor*) may be gathered like inanimate objects from an old board fence or from the spatterdock leaves. Formerly, painted turtles and snapping turtles lived in the swamp but I have seen neither for a year or two. There are no fish and but few salamanders (*Amblystoma*) in the swamp. Red-winged blackbirds and green herons nest at the swamp. There is one muskrat house, and raccoons are frequent visitors.

The waters teem with varied insect life. The number of species of dragonflies observed is not large but individuals of certain species are legion. This and one other swamp in Wells County are the only known stations in the state for *Sympetrum*